

Asia squeezes Europe's lead in science

WASHINGTON DC

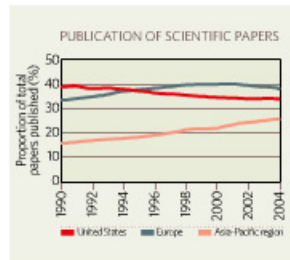
Asian nations are catching up with Europe and the United States in terms of scientific output, says a US report. If current trends continue, publications from the Asia-Pacific region may outstrip those from the United States within six or seven years.

In 2004, the report shows, countries from the Asia-Pacific region, including China, South Korea, Taiwan, Japan, Singapore and India, produced 25% of the world's research papers. In 1990, Asia's share of the scientific output was just 16%.

"The rise of the Asia-Pacific nations seems the most striking thing," says Christopher King, editor of the newsletter *Science Watch*, which published the report in its July/August issue. The newsletter is produced by Thomson Scientific, based in Philadelphia, Pennsylvania, which owns a widely used citation database — Thomson ISI.

By comparison, Europe last year produced 38% of the world's scientific papers, and the United States produced 33% (see Graph). Although it is the current world leader, Europe is beginning to worry. The European Commission is due to release a report this week saying that the European Union (EU) may not reach its stated spending goals for research and development by the end of this decade.

Thomson's findings echo a highly regarded



2004 National Science Foundation (NSF) analysis — the biennial Science and Engineering Indicators. This showed that the number of US papers published has remained essentially flat over the past decade, whereas the rest of the world has been publishing more with every year.

Within Asia, the NSF analysis found, China, South Korea, Singapore and Taiwan grew the most. Between 1988 and 2001, article output rose nearly fivefold in China, sixfold in Singapore and Taiwan, and by 14 times in South Korea. At the same time, article output rose only 1.1 times in the United States, 1.6 times in Europe and 1.4 times worldwide.

Those trends haven't changed much in the

past three years, says Robert Bell, a senior analyst at the NSF.

One reason for the higher Asian publication share is strong economic growth and the resulting increase in research funding, says Mu-Ming Poo, a neuroscientist at the University of California, Berkeley, who spends part of every year as director of the Institute of Neuroscience in Shanghai.

What's more, Poo says, research performance in Asia is now increasingly evaluated in terms of the publications in journals that are indexed by Thomson Scientific.

In China, some institutions even pay researchers extra for publications in indexed journals, especially ones that carry widely cited articles, says Wu Yishan, who analyses Chinese research performance for the Institute of Scientific and Technical Information in Beijing. "Such incentives are effective in promoting more publications," he says.

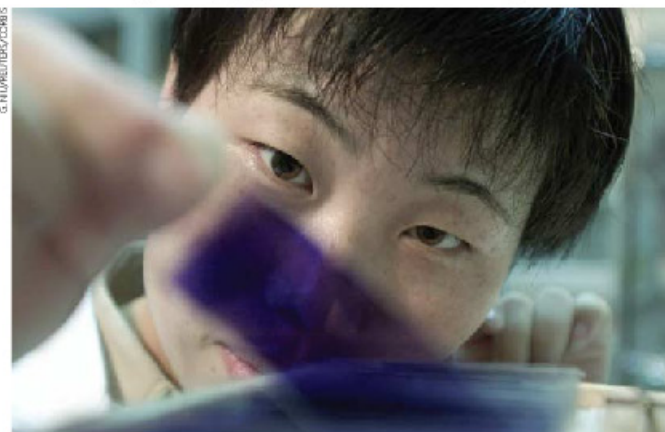
The reasons behind the stagnating number of US publications are less clear, says Bell. The NSF has collected data from the top 200 US universities to look for correlations between the number of research publications and other factors, such as the number of postdocs and graduate students or the amount of research funding. All these factors are important, says Bell, but no particular one stands out as the driving force behind scientific output. "There is no smoking gun," he says.

As for Europe, its first-place standing does not mean everything, cautions Vincent Duchêne, an analyst at the European Commission in Brussels. The United States publishes more papers per researcher than Europe, and with greater impact.

Duchêne helped to prepare this week's EU report, which warns that Europe may fall further behind. In 2002, the EU set a target for its research and development 'intensity': 3% of its gross domestic product by 2010. In 2003, its intensity was 1.9% — lower than the United States' 2.6% and higher than China's 1.3%. But China's intensity has grown by more than 10% a year, while Europe's has increased only gradually.

If those trends continue, the report says, China's research and development intensity will catch up with Europe's by 2010.

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Paper tigers: countries in the Asia-Pacific region are boosting their production of scientific articles.